

Blood Analysis



Hematocrit Determination

1. Hematocrit values are usually (higher / lower) in healthy males, compared to healthy females.

Give one possible explanation for this. _____

2. Living at high elevations will cause a person's hematocrit to (increase / decrease).

Explain your answer. _____

3. Long-term athletic training will cause a person's hematocrit to (increase / decrease).

4. What is anemia? _____

5. Anemia will cause a person's hematocrit to (increase / decrease).

6. Pernicious anemia is due to a lack of vitamin _____

7. How does deficiency of intrinsic factor lead to pernicious anemia? _____

8. Why would a diet deficient in iron lead to anemia? _____

9. Which hormone, secreted by the kidney, is responsible for increased production of red blood cells?

Erythrocyte Sedimentation Rate (ESR)

10. Sickled red blood cells have an abnormal shape and do not tend to form stacks of cells (rouleaux formation). This would (increase / decrease) the sedimentation rate.

11. Is the ESR test a specific test used to diagnose a disease? _____

12. The blood of a cancer patient undergoing chemotherapy is given an ESR test. The results show a slower ESR from the previous month. What might this indicate about the patient's disease?

13. How can the ESR be useful in the evaluation of a patient complaining of chest pains?

14. How can the ESR be useful in the evaluation of a female patient suffering from severe abdominal pains?

Hemoglobin Determination

15. What is the value, in terms of grams of hemoglobin per 100 milliliters of blood, for the following:

a. healthy male: _____

b. healthy female: _____

c. male with polycythemia: _____

d. female with iron deficiency anemia: _____

16. Explain your answer to (c) above. _____

17. Explain your answer to (d) above. _____

18. Complete the following questions to describe hemoglobin.

How many polypeptide chains form the globin portion of the molecule? _____

Each heme group contains an atom of the element _____.

How many heme groups are contained in one molecule of hemoglobin? _____

Each hemoglobin molecule can transport _____ molecules of oxygen.

What color is oxyhemoglobin? _____

19. Hemoglobin values rise in COPD (chronic obstructive pulmonary disease). Give a possible explanation for this.

20. Hemoglobin values decrease in renal disease. Give a possible explanation for this.

Blood Typing

21. Define the following terms.

agglutinogen: _____

agglutinin: _____

gene allele: _____

22. What is the most common ABO blood type in the United States? _____

23. What is the least common ABO blood type in the United States? _____

24. Most Americans are Rh (positive / negative).

25. *Erythroblastosis fetalis* is an uncommon condition in newborn infants. In this condition, the baby is Rh (positive / negative) and the mother is Rh (positive / negative).

26. If your blood agglutinates with both anti-A and anti-B sera, your blood type is _____.

27. If you have type O blood, which antigens are present on your red blood cells?

Which antibodies are present in your plasma? _____

28. Blood type O is considered to be the universal donor type. However, if type O blood is transfused into a person with blood type B, which of the following is important to remember? _____

- Use the entire pint of type O blood for the transfusion
- Separate the type O blood into packed cells and plasma, and use only the packed cells for the transfusion
- Separate the type O blood into packed cells and plasma, and use only the plasma for the transfusion

Total Blood Cholesterol Determination

29. Cholesterol is an essential factor in homeostasis. Name four uses that the human body has for cholesterol.

a. _____

b. _____

c. _____

d. _____

30. Most of the cholesterol that your body needs is made by what organ? _____

31. High blood cholesterol levels are above _____ mg/100 ml of blood.

32. What is atherosclerosis? _____

33. What is the connection between high blood cholesterol levels and atherosclerosis?

34. What are lipoproteins? _____

35. Low density lipoproteins (LDLs) transport cholesterol to _____

_____.

36. High density lipoproteins (HDLs) transport cholesterol from the _____ to the _____, where it is broken down and becomes part of bile.

37. Cigarette smoking, stress, and coffee drinking increase levels of _____, or “bad cholesterol.”

38. Regular aerobic exercise increases levels of _____, or “good cholesterol.”